

WHAT IS CLAIMED IS:

1. A furnace component that is exposed to a hydrocarbon containing gas stream, the furnace component comprising an inorganic material; wherein at least a portion of the exposed inorganic material comprises a catalyst that promotes a hydrocarbon reaction to produce an olefin.
2. A furnace component according to claim 1 wherein the inorganic material is a glass, glass-ceramic, or ceramic material.
3. A furnace component according to claim 2 wherein the inorganic material comprises 5-50 weight % MgO and 15-95 weight % B₂O₃.
4. A furnace component according to claim 2 wherein the inorganic material comprises 5-50 weight % MgO and 10-95 weight % P₂O₅.
5. A furnace component according to claim 2 wherein the inorganic material is a barium aluminosilicate.
6. A furnace component according to claim 5 wherein the glass-ceramic material comprises 20-65 weight % BaO, 20-65 weight % SiO₂, and up to 45 weight % Al₂O₃.
7. A furnace component according to claim 1 wherein the inorganic material is a borosilicate glass.
8. A furnace component according to claim 7 wherein the glass comprises 15-60 weight % SiO₂, 5-50 weight % MgO, and 5-50 weight % B₂O₃.
9. A furnace component according to claim 1 wherein the catalyst is chosen from the group consisting of rare earth metals, precious metals, transition metals, non-metals and their corresponding compounds.

10. A furnace component according to claim 9 wherein the catalyst is chosen from the group consisting of Pt, Pd, Ir, Rh, Ru, Ni, Co, Cr, Zn, Ca, Fe, B, P, Mo and their corresponding compounds.

11. A furnace component according to claim 1 wherein the inorganic material is adhered to the surface of a metal substrate.

12. A furnace component according to claim 11 wherein the metal substrate is the inside wall of a hydrocarbon cracking reactor.

13. A furnace component according to claim 1 wherein the inorganic material comprises particles, powder, beads, monoliths, or other structured shapes.

14. A furnace component according to claim 1 wherein the inorganic material is contained within a packed bed.

15. A furnace component according to claim 1 wherein the inorganic material is inserted into the furnace.

16. A furnace component according to claim 1, further comprising a second catalyst promoting carbon gasification.

17. A furnace component according to claim 16 wherein the second catalyst is chosen from the group consisting of alkali metals, alkaline earth metals, transition metals, and precious metals and their compounds.

18. A furnace component according to claim 17 wherein the second catalyst is K, Ca, Ba, P, Pd, Rh, Mn, V and their compounds.

19. A furnace component according to claim 16 wherein the second catalyst comprises the same material as that of the catalyst of claim 1.

20. A method of making a furnace component, the method comprising;

- a) melting together the components of a base glass-ceramic material and a catalyst that promotes a carbon reaction to produce an olefin and,
 - b) cooling the melt to provide a solid composition.
21. The method according to claim **20** further comprising:
- c) milling the solid composition to yield a powder, and
 - d) heating the powder to induce ceraming.
22. A method according to claim **20** wherein the components of the base glass ceramic comprises 5-65 weight. % MgO and 15-95 weight. % B₂O₃.
23. A method according to claim **20** wherein the components of the base glass ceramic comprises 15-65 weight % MgO and 10-95 weight. % P₂O₅.
24. A method according to claim **20** wherein the components of the base glass ceramic comprises 20-65weight % BaO, 20-65 weight % SiO₂, and up to 15 weight % Al₂O₃.
25. A method according to claim **20** wherein the components of the base glass ceramic comprises 15-60 weight % SiO₂, 5-50 weight % MgO, and 5-50 weight % B₂O₃.
26. A method according to claim **20** wherein the catalyst is chosen from the group consisting of rare earth metals, rare earth metal oxides, transition metals, transition metal oxides and non-metal oxides
27. A method according to claim **20** wherein the catalyst is chosen from the group consisting of Pt, Pd, Ir, Rh, Ru, Ni, Co, Cr, Zn, Ca, Fe, B, P, Mo and their corresponding compounds.